REMARKS

In the Specification

Paragraph 0007 Amendment

The amendment to Paragraph 0007 of the Specification clarifies that the same wavelength range of light is incident upon both of the photo-detectors of the present invention as seen in Figure 2 of the application. Therefore, the amendment deletes the reference to a first and second wavelength of light incident upon the photo-detectors and, instead, refers to a wavelength of light being converted into two electronic signals by the two sensors. Because the amendment merely clarifies the nature of the electromagnetic spectrum incident upon the photo-detectors of the present invention, the amendment to Paragraph 0007 does not constitute new matter.

Paragraph 0008 Amendment

The amendment to Paragraph 0008 of the Specification clarifies that the same wavelength range of light is incident upon both of the photo-detectors of the present invention as seen in Figure 2 of the application. Therefore, the amendment deletes the reference to a first and second wavelength of light incident upon the photo-detectors and, instead, refers to a wavelength of light being converted into two electronic signals by the two sensors. Because the amendment merely clarifies the nature of the electromagnetic spectrum incident upon the photo-detectors of the present invention, the amendment to Paragraph 0008 does not constitute new matter.

Paragraph 0010 Amendment

The amendment to Paragraph 0010 of the Specification clarifies that the same wavelength range of light is incident upon both of the photo-detectors of the present invention as seen in Figure 2 of the application. Therefore, the amendment deletes the reference to a first and second

wavelength of light incident upon the photo-detectors and, instead, refers to a wavelength of light being converted into two electronic signals by the two sensors. Because the amendment merely clarifies the nature of the electromagnetic spectrum incident upon the photo-detectors of the present invention, the amendment to Paragraph 0010 does not constitute new matter.

Paragraph 0024 Amendment

The amendment to Paragraph 0024 of the Specification clarifies that the same wavelength range of light is incident upon both of the photo-detectors of the present invention as seen in Figure 2 of the application. Therefore, the amendment deletes the reference to a first and second wavelength of light incident upon the photo-detectors and, instead, refers to a wavelength of light being converted into two electronic signals by the two sensors. Because the amendment merely clarifies the nature of the electromagnetic spectrum incident upon the photo-detectors of the present invention, the amendment to Paragraph 0024 does not constitute new matter.

Paragraph 0032 Amendment

The amendment to Paragraph 0032 clarifies the correct mathematical operation being conducted on the first and second electronic signals as reflected in Figure 3 of the application. Because the amendment merely clarifies that which is shown in Figure 3 and is described in the Specification, the amendment to Paragraph 0032 does not constitute new matter.

In the Claims

Claim 1 Amendment

Claim 1 has been amended to clarify that the first and second wavelengths of light are the same wavelengths incident upon the photo-detectors. Thus, it is not necessary to distinguish between a first and second wavelength of light. Because the amendment merely clarifies the nature

of the electromagnetic spectrum incident upon the photo-detectors of the present invention, the amendment to Claim 1 does not constitute new matter.

Claim 9 Amendment

Claim 9 has been amended to clarify that the first and second wavelengths of light are the same wavelengths incident upon the photo-detectors. Thus, it is not necessary to distinguish between a first and second wavelength of light. Because the amendment merely clarifies the nature of the electromagnetic spectrum incident upon the photo-detectors of the present invention, the amendment to Claim 9 does not constitute new matter.

Claim 16 Amendment

Claim 16 has been amended to clarify that the first and second wavelengths of light are the same wavelengths incident upon the photo-detectors. Thus, it is not necessary to distinguish between a first and second wavelength of light. Because the amendment merely clarifies the nature of the electromagnetic spectrum incident upon the photo-detectors of the present invention, the amendment to Claim 16 does not constitute new matter.

Claim 17 Amendment

Claim 17 depends upon Claim 16. Claim 16 has been amended to clarify that the first and second wavelengths of light are the same wavelengths incident upon the photo-detectors. Thus, it is not necessary to distinguish between a first and second wavelength of light. Because the amendment merely clarifies the nature of the electromagnetic spectrum incident upon the photo-detectors of the present invention, the amendment to Claim 17 does not constitute new matter.

Claim 17 Objection

Claim 17 stands objected to as being unclear regarding whether "a first wavelength range of light" in line 3 is the same "first wavelength range of light" as claimed in Claim 16 and whether "a second wavelength range of light" in line 5 is the same "second wavelength range of light" as claimed in Claim 16. Claim 16 has been amended to clarify that the first and second wavelengths of light are the same wavelengths incident upon the photo-detectors. Thus, it is not necessary to distinguish between a first and second wavelength of light. Claim 17 has been amended to conform to Claim 16, which moots the objection to Claim 17.

Rejections Under 35 U.S.C. 102(b)

Claims 1-6, 8-12, 14, and 15

Claims 1-6, 8-12, 14, and 15 stand rejected under 35 U.S.C. 102(b) as being anticipated by Kato et al. US Patent No. 3,617,753 ("Kato").

Claim 1

As for Claim 1, Applicant respectively traverses the Examiner's rejection and reasoning. In the fifth paragraph of page 2 of the Office Action, the Examiner states that regarding Claim 1: "Kato et al. teach an apparatus for generating an electronic signal in response to selected wavelengths of light comprising (see Fig. 3) a first photodiode (22a) for converting at least the selected wavelengths of light to a corresponding first electronic signal, a second photodiode (22b) for converting at least additional wavelengths of light to a corresponding second electronic signal, and a circuit (see Fig. 8) *for manipulating the first and second electronic signals to generate an output signal in response to the selected wavelengths of light" (Emphasis Added).*

Applicant respectfully responds that Figure 8 of Kato is a circuit that uses planar transistors and MOS transistors to collect and output the red, blue and green information of light. Neither Figure 8, nor the Specification of Kato, teach or address the manipulation of the electronic information in any way so as to emphasize or attenuate one wavelength over another, as claimed.

Rather, the invention disclosed in Kato is directed toward capturing red, blue and green information using semiconductor material and outputting the captured information electronically without further manipulation. While the invention of Kato captures red, blue and green light information and converts it to electronic signals, it also has unwanted responsiveness to other portions of the electromagnetic spectrum, such as infrared. Kato does not address this disadvantage by using a differential response.

In contrast, the present invention discloses and claims a method and apparatus that overcomes difficulties in producing photo-detectors that are responsive only to selective wavelengths and in particular, the present invention allows the elimination of long wavelength signals such as infrared, without the use of external filters. *See*, the Title, the Abstract, paragraphs 4 and 25, Step 110 of Figure 2, Figure 3 and through-out the Specification. In the circuit of one preferred embodiment of the present invention, the first and second electronic signals which derive from the light information are manipulated to generate an output signal responsive to selected wavelengths of light. *See*, Paragraphs 8, and 10. The coupling of photodiodes (12) and (14), with dissimilar optical thickness as shown, in the circuit of Figure 3 of the present invention, advantageously creates a response differential. The rest of the elements of Figure 3 of the present invention provide a circuitry that permits the further manipulation of the electronic signals derived from the differential light information. The signal differential of the present invention reduces the costs and complexities of an integrated wave-light responsive photoconductive apparatus without requiring filters.

For a prior-art reference to anticipate under 35 U.S.C. Section 102, every element of the claimed invention must be identically shown in a single reference. These elements must be arranged as in the claims under review. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567-68 (Fed. Cir. 1990). As such, Kato cannot anticipate Claim 1 or any of its respective dependent claims.

Claim 9

As for Claim 9, Applicant respectively traverses the Examiner's rejection and reasoning. In the fifth paragraph of page 3 of the Office Action, the Examiner states that regarding Claim 9: "Kato et al. teach an apparatus for generating an electronic signal in response to selected wavelengths of

light comprising (see Fig. 3) a first sensor (22a) for converting at least the selected wavelengths of light to a corresponding first electronic signal, a second sensor (22b) for converting at least additional wavelengths of light to a corresponding second electronic signal, *wherein the first and second sensors are provided with a spectral sensitivity differential (see Fig. 9 and Col. 4, lines 40-49), and a circuit (see Fig. 8) for manipulating the first and second electronic signals to generate an output signal in response to the selected wavelengths of light" (Emphasis Added).*

Applicant respectfully responds that Kato teaches and is solely directed toward outputting color signals that correspond to images in the foreground that become incident upon the substrate. More specifically, outputting the captured information corresponding to the red, green and blue components of light. *See,* Specification and independent Claims1, 4, 7 and 10. Figure 8 of Kato is a circuit that uses planar transistors and MOS transistors to collect and output the red, blue and green information of light. Neither Figure 8, nor the Specification of Kato, address the manipulation of the electronic information in any way so as to emphasize or attenuate one wavelength over another, as disclosed and claimed. Further, no mention is made in Kato of manipulating certain wavelengths of light. While the invention of Kato captures red, blue and green light information and converts it to electronic signals, it also has unwanted responsiveness to other portions of the electromagnetic spectrum, such as infrared. Kato does not address this disadvantage by using a differential response.

In contrast, the present invention advantageously discloses and claims a method and apparatus that overcomes difficulties in producing photo-detectors that are responsive only to selective wavelengths, and in particular, the present invention allows the elimination of long wavelength signals such as infrared, without the use of external filters. *See*, the Title, the Abstract, paragraphs 4 and 25, Step 110 of Figure 2, Figure 3 and throughout the Specification. In one circuit of the present invention, the first and second electronic signals which derive from the light information are manipulated to generate an output signal responsive to the selected wavelengths of light. *See*, Paragraphs 8, and 10. The coupling of photodiodes (12) and (14), with dissimilar optical thickness, in the circuit shown in Figure 3 of the present invention creates a response differential. The rest of the elements of Figure 3 of the present invention provide a circuitry that permits the further manipulation of the electronic signals derived from the differential light information. The

signal differential of the present invention reduces the costs and complexities of an integrated wave-light responsive photoconductive apparatus without requiring filters.

For a prior-art reference to anticipate under 35 U.S.C. Section 102, every element of the claimed invention must be identically shown in a single reference. These elements must be arranged as in the claims under review. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567-68 (Fed. Cir. 1990). As such, Kato cannot anticipate Claim 9 or any of its respective dependent claims.

Claims 2-4, 10 and 15

As for Claims 2-4, 10 and 15, Applicant respectively traverses the Examiner's rejection and reasoning. In the fifth paragraph of page 3 of the Office Action, the Examiner states that regarding Claims 2-4, 10, and 15: "Kato et al. teach the first and second photodiodes provided with a spectral sensitivity differential, having dissimilar optical thickness, and at least one photodiode configured for converting visible light to an electronic signal. (see Fig. 9 and Col. 4, lines 38-49)."

Applicant respectfully responds that Kato is solely directed toward outputting captured information corresponding to the red, green and blue components of light. In contrast, the present invention discloses and claims a method and apparatus that takes the first and second electronic signals which derive from the light information and further manipulates them to generate an output signal responsive to the selected wavelengths of light. *See*, Paragraphs 8, and 10. The coupling of photodiodes (12) and (14), with dissimilar optical thickness, in the circuit shown in Figure 3 of the present invention creates the response differential. In Kato, no coupling of the first and second diodes occur so as to output a selected wavelength of light nor is there any manipulation of the electronic signals in Kato so as to achieve a selected wavelength of light. The present invention advantageously allows the elimination of long wavelength signals such as infrared, without the use of external filters.

For a prior-art reference to anticipate under 35 U.S.C. Section 102, every element of the claimed invention must be identically shown in a single reference. These elements must be arranged as in the claims under review. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567-68 (Fed. Cir. 1990). As such

Kato cannot anticipate Claims 2-4, 10 and 15. Further, since Claims 2-4 depend on Claim 1, and as noted, since Kato cannot anticipate Claim 1, it also cannot anticipate Claims 2-4. Further still, since Claims 10 and 15 depend on Claim 9, and as noted, since Kato cannot anticipate Claim 9, it also cannot anticipate Claims 10 and 15.

Claims 5 and 11

As for Claims 5 and 11, Applicant respectively traverses the Examiner's rejection and reasoning. In the fifth paragraph of page 3 of the Office Action, the Examiner states that regarding Claims 5 and 11: "Kato et al. teach one photodiode having an optical thickness of about 7.0 micrometers (see Col. 4, lines 39-41)."

Applicant respectfully responds that the photodiode having an optical thickness of about 7.0 micrometers is but one aspect of the present invention. Kato is solely directed toward using photodiodes with different optical thickness to output captured light information corresponding to the red, green and blue components of light. In contrast, the present invention advantageously discloses and claims a method and apparatus that takes the first and second electronic signals, which derive from the photodiodes with differing optical thickness, and further manipulates them to generate an output signal responsive to the selected wavelengths of light. In particular, the present invention allows the elimination of long wavelength signals such as infrared, without the use of external filters. *See*, Paragraphs 8, and 10. The coupling of photodiodes (12) and (14), with dissimilar optical thickness, in the circuit shown in Figure 3 of the present invention creates the response differential. In Kato, no coupling of the first and second diodes occur so as to output a selected wavelength of light nor is there any manipulation of the electronic signals in Kato so as to achieve a selected wavelength of light.

For a prior-art reference to anticipate under 35 U.S.C. Section 102, every element of the claimed invention must be identically shown in a single reference. These elements must be arranged as in the claims under review. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567-68 (Fed. Cir. 1990). As such, Kato cannot anticipate Claims 5 and 11. Further, since Claim 5 depends on Claim 1, and as noted,

since Kato cannot anticipate Claim 1, it also cannot anticipate Claim 5. Further still, since Claim 11 depends on Claim 9, and as noted, since Kato cannot anticipate Claim 9, it also cannot anticipate Claim 11.

Claims 8 and 14

As for Claims 8 and 14, Applicant respectively traverses the Examiner's rejection and reasoning. In the fifth paragraph of page 3 of the Office Action, the Examiner states that regarding Claims 8 and 14: "Kato et al. teach (see Fig. 8) the circuit for manipulating the first and second signals comprising a scaling circuit (43)."

Applicant respectfully responds that the disclosure of Kato does not disclose or refer to a scaling circuit. Kato is solely directed toward using photodiodes with different optical thickness to output captured light information corresponding to the red, green and blue components of light. In contrast, the present invention advantageously discloses and claims a method and apparatus that takes the first and second electronic signals, which derive from the photodiodes (however constructed), and manipulates them to generate an output signal responsive to the selected wavelengths of light. *See*, Paragraphs 8, and 10. In particular, the present invention allows the elimination of long wavelength signals such as infrared, without the use of external filters.

For a prior-art reference to anticipate under 35 U.S.C. 102, every element of the claimed invention must be identically shown in a single reference. These elements must be arranged as in the claims under review. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567-68 (Fed. Cir. 1990). As such, Kato does not anticipate Claims 8 and 14. Further, since Claim 8 depends on Claim 1, and as noted, since Kato cannot anticipate Claim 1, it also cannot anticipate Claim 8. Further still, since Claim 14 depends on Claim 9, and as noted, since Kato cannot anticipate Claim 9, it also cannot anticipate Claim 14.

Claims 16-20

Claims 16-20 stand rejected under 35 U.S.C. 102(b) as being anticipated by Shih, et al. US Patent No. 5,999,271 ("Shih").

As for Claims 16 to 20, Applicant respectively traverses the Examiner's rejection and reasoning. In the sixth paragraph of page 4 of the Office Action, the Examiner states that regarding Claims 16 to 20: "Shih et al. teach a method for generating an electronic signal corresponding to selected wavelengths of light, said method comprising the steps of converting (see Col. 5, lines 9-22) at least first and second wavelength ranges of light (see Fig. 10 and Col. 5, lines 37-41) into first and second electronic signals wherein at least one of the wavelength ranges includes the selected wavelengths, and manipulating (see Col. 5, line 65 to Col. 6, line 3) the first and second electronic signals to generate an output signal (see Col. 6, line 3-5) corresponding to the selected wavelengths of light."

Applicant respectfully responds that invention of Shih uses external filters to accomplish its objectives. In contrast, the present invention advantageously allows the elimination of long wavelength signals such as infrared, without the use of external filters. The disclosure of Shih is directed toward the detection and wavelength discrimination of monochromatic (i.e., laser) light beams with at least one detector pair consisting of a first photo-detector and a second photo-detector aligned with the first photo-detector and a wavelength dependent *external* variable attenuator or filter on top of the second photo-detector. Through a comparison of the current value between the first and second photo-detector, the value of the light beam can be determined. *See* Summary paragraph 2. A second embodiment of wavelength detection and determination of a monochromatic light beam uses an *external* thin film wavelength dependent variable attenuator superimposed on the surface of the second photo-detector. Through a comparison of the current values between the first and second photo-detector, the value of the light beam can be determined. *See* Summary paragraph 3. The focus of Shih is the detection of single wavelength laser beams using two photo-detectors. Shih uses *external* variable attenuators over one of the photo-detectors in order to obtain a ratio between the values of the current from the first photo-detector and the second photo-detector to determine a wavelength of the light beam. *See* Specification.

In contrast, the present invention as claimed is advantageously capable of accepting a full spectrum of wavelengths of light, not just that which is monochromatic, and discriminating among all of the light incident upon the substrate to output an electronic signal which eliminates certain wavelengths, specifically those in the infrared spectrum, without the uses of external filters.

For a prior-art reference to anticipate under 35 U.S.C. Section 102, every element of the claimed invention must be identically shown in a single reference. These elements must be arranged as in the claims under review. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567-68 (Fed. Cir. 1990). Shih is directed toward a method of capturing a full intensity monochromatic light beam and an attenuated intensity light beam of the same wavelength, and then comparing the two to determine the wavelength of the monochromatic light beam. In that regard, Shih focuses almost exclusively on embodiments consisting external filters to accomplish different attenuation techniques. The present invention is directed toward capturing wavelengths of light, and combining them without the use of external filters so as to eliminate selected wavelengths of light, such as infrared. As such, Shih cannot anticipate Claim 16 or any of its respective dependent claims.

Claim 17

As for Claim 17, Applicant respectively traverses the Examiner's rejection and reasoning. In the sixth paragraph of page 4 of the Office Action, the Examiner states that regarding Claim 17: "Shih et al. teach the converting step further comprising the steps of converting (see Col. 5, lines 9-14) a first wavelength range of light, including at least the selected wavelengths of light, to a corresponding first electronic signal, and converting (see Col. 5, lines 9-14) a second wavelength range of light, including at least wavelengths distinct from the selected wavelengths of light (see Fig. 10 and Col. 5, lines 24-28), to a corresponding second electronic signal."

Applicant respectfully responds that the disclosure of Shih is directed toward the detection and wavelength discrimination of monochromatic (i.e., laser) light beams with at least one detector pair consisting of a first photo-detector and a second photo-detector aligned with the first photo-detector and a wavelength dependent *external* variable attenuator or filter on top of the second

photo-detector. In contrast, the present invention advantageously allows the elimination of long wavelength signals such as infrared, without the use of external filters. The present invention processes the information from each of the photo-detectors so as to eliminate the long wavelength information. Shih, on the other hand, is directed toward identifying the wavelength incident upon the photo-detectors, regardless of its wavelength.

For a prior-art reference to anticipate under 35 U.S.C. Section 102, every element of the claimed invention must be identically shown in a single reference. These elements must be arranged as in the claims under review. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567-68 (Fed. Cir. 1990). As such, Shih does not anticipate Claim 17. Further, since Claim 17 depends on Claim 16, and as noted, since Shih cannot anticipate Claim 16, it also cannot anticipate Claims 17.

Claim 18

As for Claim 18, Applicant respectively traverses the Examiner's rejection and reasoning. In the sixth paragraph of page 4 of the Office Action, the Examiner states that regarding Claim 18: "Shih et al. teach a further step of using a differential between the first electronic signal and the electronic second signal (see Col. 5, lines 21-23 and Col. 5, line 65 to Col. 6, line 5) to generate the output signal."

Applicant respectfully responds that the disclosure of Shih is directed toward the detection and wavelength discrimination of monochromatic (i.e., laser) light beams with at least one detector pair consisting of a first photo-detector and a second photo-detector aligned with the first photo-detector and a wavelength dependent *external* variable attenuator or filter on top of the second photo-detector. The invention of Shih is concerned with using external filters to convert a *first* wavelength of light (monochromatic) and an attenuated version of the *first* wavelength of light to corresponding first and second electronic signals in order to identify the value of said monochromatic wavelength of light. The present invention as claimed is advantageously capable of accepting a full spectrum of wavelengths of light, not just that which is monochromatic, and discriminating among the wavelengths of light incident upon the substrate to output an electronic

signal which eliminates certain wavelengths, specifically those in the infrared spectrum, without the uses of external filters.

For a prior-art reference to anticipate under 35 U.S.C. Section 102, every element of the claimed invention must be identically shown in a single reference. These elements must be arranged as in the claims under review. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567-68 (Fed. Cir. 1990). As such, Shih does not anticipate Claim 18. Further, since Claim 18 depends on Claim 16, and as noted, since Shih cannot anticipate Claim 16, it also cannot anticipate Claims 18.

Claim 19

As for Claim 19, Applicant respectively traverses the Examiner's rejection and reasoning. In the sixth paragraph of page 4 of the Office Action, the Examiner states that regarding Claim 19: "Shih et al. teach a step of selecting first and second wavelength ranges which partially overlap (see Fig. 4 and 10)."

Applicant respectfully responds that the disclosure of Shih is directed toward the detection and wavelength discrimination of monochromatic (i.e., laser) light beams with at least one detector pair consisting of a first photo-detector and a second photo-detector aligned with the first photo-detector and a wavelength dependent *external* variable attenuator or filter on top of the second photo-detector. This is substantively different from the objective and, thus, arrangement of the components of the present invention. The present invention as claimed is advantageously capable of accepting a full spectrum of wavelengths of light, not just that which is monochromatic, and discriminating among the wavelengths of light incident upon the substrate to output an electronic signal which eliminates certain wavelengths, specifically those in the infrared spectrum, without the uses of external filters.

For a prior-art reference to anticipate under 35 U.S.C. Section 102, every element of the claimed invention must be identically shown in a single reference. These elements must be arranged as in the claims under review. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567-68 (Fed. Cir. 1990). As such,

Shih cannot anticipate Claim 19. Further, since Claim 19 depends on Claim 16, and as noted, since Shih cannot anticipate Claim 16, it also cannot anticipate Claims 19.

Claim 20

As for Claim 20, Applicant respectively traverses the Examiner's rejection and reasoning. In the sixth paragraph of page 5 of the Office Action, the Examiner states that regarding Claim 20: "Shih et al. teach the selected wavelengths comprising visible light (see Col. 8, lines 49-50)."

Applicant respectfully responds that the disclosure of Shih is directed toward the detection and wavelength discrimination of monochromatic (i.e., laser) light beams with at least one detector pair consisting of a first photo-detector and a second photo-detector aligned with the first photo-detector and a wavelength dependent *external* variable attenuator or filter on top of the second photo-detector. The objective of the Shih invention is the determination of a monochromatic light beam. In contrast, the plurality of photodiodes of the present invention as claimed are directed toward eliminating a selected wavelength of light incident upon the photo-detectors, specifically, in the infrared spectrum, without the use of external filters.

For a prior-art reference to anticipate under 35 U.S.C. Section 102, every element of the claimed invention must be identically shown in a single reference. These elements must be arranged as in the claims under review. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567-68 (Fed. Cir. 1990). As such, Shih cannot anticipate Claim 20. Further, since Claim 20 depends on Claim 16, and as noted, since Shih cannot anticipate Claim 16, it also cannot anticipate Claims 20.

Rejections Under 35 U.S.C. 103(a)

Claims 7 and 13 stand as rejected under 35 U.S.C. 103(a) as being unpatentable over Kato et al. in view of Shoda US Patent No. 5,747,863.

As for Claims 7 an 13, Applicant respectively traverses the Examiner's rejection and reasoning. In the eighth paragraph of page 5 of the Office Action, the Examiner states that regarding

Claims 7 and 13 "Kato et al. teach an apparatus for generating an electronic signal in response to selected wavelengths of light comprising a first and second sensor for converting 2 wavelength ranges of light into a first and second electronic signal and a circuit for manipulating the first and second electronic signals to generate an output signal in response to the selected wavelengths of light. Kato et al. do not teach the circuit for manipulating the first and second signals comprising an arithmetic logic circuit. Shoda teaches an image pickup device with a first sensor (6) (see Fig. 7 and Col. 12, lines 29-35) and a second sensor (7) (see Fig. 8 and Col. 12, lines 35-42) wherein the first and second sensors are provided with a spectral sensitivity differential (see Col. 13, lines 8-14), and an arithmetic logic circuit (5) (see Fig. 9 and Col. 4, lines 48-50 and Col. 13, lines 21 25) for manipulating the first and second electronic signals to generate an output signal. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the arithmetic logic circuit of Shoda in the apparatus of Kato et al., to process the differential between the two electronic signals to accurately analyze the spectral content of the incident light."

Applicant will first point out why the teaching of **each** of the cited references is different from the claimed invention, and then demonstrate why the **combination** of the cited references still fails to render the claimed invention obvious.

Kato discloses a circuit that uses planar transistors and MOS transistors to collect and output the red, blue and green information of light. Kato does not address the manipulation of the electronic information in any way so as to emphasize or attenuate one wavelength over another. While the invention of Kato captures red, blue and green light information and converts it to electronic signals, it also has unwanted responsiveness to other portions of the electromagnetic spectrum, such as infrared. Kato does not address this disadvantage by using a differential response.

On the other hand, the invention of Shoda is directed toward an infrared solid-state image pick-up device so as to identify non-visible objects by their temperature. In this manner, the device of Shoda can operate as an infrared thermometer. The wavelengths of electromagnetic spectrum corresponding to specific temperatures from the object are converted into electronic signals operable to allow them to be displayed as a color image, not only based on the intensity of the infrared emission, but also on the temperature distribution of the object. The purpose of the arithmetic circuit

in Shoda is to take signals from the sensors and obtain a set of ratios of the signals that are compared to a predetermined absolute temperature of a blackbody. This relationship allows the calculation of the temperature of the object independently of the value of the emissivity.

In contrast to both Kato and Shoda, in the present invention as claimed, the first and second electronic signals which derive from the light information are manipulated to generate an output signal responsive to the selected wavelengths of light. *See*, Paragraphs 8, and 10. The coupling of photodiodes (12) and (14), with dissimilar optical thickness, in the circuit shown in Figure 3 of the present invention creates a response differential. The rest of the elements of Figure 3 of the present invention provide a circuitry that permits the further manipulation of the electronic signals derived from the differential light information. Such manipulation is directed toward the elimination of infrared information. The signal differential of the present invention reduces the costs and complexities of an integrated wave-light responsive photoconductive apparatus without requiring external filters. The present invention is directed to the visible range of the electromagnetic spectrum. Each of the pending independent Claims 1, 9 and 16 recites the generation of electronic signals in response to selected wavelengths of light and a circuit for manipulating, or the process of manipulating, said electronic signals. Further, dependent Claims 7 and 13 recite the use of an arithmetic logic circuit to manipulate said electronic signals

Contrary to what is claimed here, namely, the manipulation of electronic signals, Kato does not teaches any manipulation of the electronic signals by any means. *See*, the Title, the Abstract, and the Specification.

Also, contrary to what is claimed here, namely, generation of electronic signals in response to selected wavelengths of light, Shoda teaches the generation of electronic signals in response to infrared wavelengths and further, teaches the use of a arithmetic circuit as a means to obtain a function that allows the determination of the temperature of an object independently of the emissivity of the object.

Combination of References

Kato does not teach or suggest the use of a mechanism or means to combine the first and second electronic signals as claimed nor does it disclose the use of an arithmetic logic circuit; and Shoda teaches the combining of different infrared, not visible light, wavelengths in an arithmetic circuit, but only as a means to derive a function to determine the temperature of an object independently of its emissivity and not as a means to eliminate the photo-response to these long wavelengths. There is no suggestion or incentive in either reference to combine these references. Even using hindsight and selective picking and choosing features of this prior art, Applicant respectfully submits that the combination of the references still falls short of rendering obvious the claimed invention.

In discussing a rejection under 35 U.S.C. 103, the Court, in *In re Wesslau*, 147 U.S.P.Q. 391, 393 (C.C.P.A. 1965) held that:

> It is impermissible within the framework of Section 103 to pick and choose from any one reference only so much of its as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.

The Examiner may not use Applicant's claims as a blueprint to pick and choose from one of the references only so much of it as will support the Examiner's position and to exclude other parts necessary to the full appreciation of what that reference fairly suggests to one of ordinary skill in the art. This type of piecemeal reconstruction of the references in light of Applicant's disclosure is not a permissible basis of holding the invention obvious. *In re Kamm and Young*, 172 U.S.P.Q. 298, 301-302 (C.C.PA. 1972).

The Federal Circuit has repeatedly held that hindsight must be avoided in combining reference structures. *Panduit Corp. v. Dennison Manufacturing Co.*, 227 U.S.P.Q. 337, 343 (Fed. Cir. 1985); *In re Find*, 5 U.S.P.Q.2d 1596, 1599-1560 (Fed. Cir. 1988). Thus, it is error to reconstruct a patentee's claimed invention from the prior art by using the patentee's claims as a blueprint. Prior art references must be read as a whole and consideration must be given where the references diverge and teach away from the claimed invention. *W.L. Gore & Associates, Inc. v.*

Garlock, Inc., 220 U.S.PQ. 303, 311-13 (Fed. Cir. 1983). A claim cannot properly be used as a blueprint for abstracting individual teachings from references. *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 227 U.S.P.Q. 657, 667 (Fed. Cir. 1985).

Other Cited Art

In the ninth paragraph of page 6 of the Office Action, the Examiner cited Matsubara et al. US Patent No. 4,804,833, as prior art made of record but not relied upon is considered pertinent to applicant's disclosure. According to the Examiner, Matsubara et al. US Patent No. 4,804,833 ("Matsubara") teaches a color sensing device and method with a first and second sensor and a circuit for manipulating the first and second electronic signals from the sensors to generate an output signal in response to the selected wavelengths of light. Applicant notes that the invention of Matsubara is directed toward a color sensing device consisting, in part, of a doped, amorphous silicon layer. Further, the method and device of Matsubara is not directed toward eliminating signals corresponding to responses to unwanted wavelengths in order to produce a calibrated response to selected wavelengths, but rather is concerned with using an arrangement to identify the color of the incident light. The present invention is not confined to being fabricated using a doped, amorphous silicon layer and is directed toward eliminating signals corresponding to responses to unwanted wavelengths. For a prior-art reference to anticipate under 35 U.S.C. 102, every element of the claimed invention must be identically shown in a single reference. These elements must be arranged as in the claims under review. *In re Bond*, 15 U.S.P.Q.2d 1566, 1567-68 (Fed. Cir. 1990). As such, Matsubara cannot anticipate Claims 1, 9 or 16 or any of their respective dependent claims.

Conclusion

Applicant respectfully submits that Claims 1-20, now pending, are in condition for allowance. A Notice of Allowance is therefore requested.

If the Examiner has any other matters which pertain to this Application, the Examiner is encouraged to contact the undersigned to resolve these matters by Examiner's Amendment where possible.

Favorable consideration of the pending claims is respectfully requested.

Respectfully Submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification

Paragraph 0007

Paragraph 0007 has been amended as follows:

[0007] The invention provides apparatus for generating an electronic signal in response to selected wavelengths of light. A first sensor is provided for converting the selected wavelengths of light to a first electronic signal. A second sensor is provided for converting said [additional] wavelengths of light to a second electronic signal. A circuit is also provided, for manipulating the first and second electronic signals to generate an output signal responsive to the selected wavelengths of light.

Paragraph 0008

Paragraph 0008 has been amended as follows:

[0008] According to another aspect of the invention, a first photodiode converts the selected wavelengths of light to a first electronic signal. A second photodiode converts said [additional] wavelengths of light to a second electronic signal. A circuit manipulates the first and second electronic signals to generate an output signal responsive to the selected wavelengths of light.

Paragraph 0010

Paragraph 0010 has been amended as follows:

[0010] According to the methods of the invention, an electronic signal corresponding to selected wavelengths of light is generated. The method includes the step of converting said [first and second] wavelength-segments of light into first and second electronic signals. The selected wavelengths are included in the converted wavelength segments. In another step, the first and

second electronic signals are manipulated to generate an output signal corresponding to the selected wavelengths of light.

Paragraph 0024

Paragraph 0024 has been amended as follows:

[0024] Figure 2 is a process flow diagram showing the steps and the method of the invention. Preliminarily, it is assumed that the invention is exposed to light 100. The light contains a continuum of wavelengths here represented by $\lambda_x - \lambda_y$. In step 102 and concurrent step 104, a photoconductivity response is obtained to non-identical spectrum segments within the continuum $\lambda_x - \lambda_y$, here represented by λ_A shown in step box 102 and λ_B shown in step box 104. The photoconductivity responses generated in steps 102 and 104 result in first and second electronic signals, shown respectively by steps 106 and 108. In step 110, the first and second electronic signals are manipulated, preferably by a circuit further described below. The principle of the manipulation step 110 is to use the differential between responses to λ_A and λ_B to produce a calibrated electronic signal. Both sensors receive the same amount of light as in the preferred embodiment. [Thus, one electronic signal for example, the first electronic signal, may be used to calibrate another electronic signal, in this example, the second electronic signal.] Accordingly, in step 112, an output signal is generated which corresponds to selected wavelengths of light, for example, λ_B. This general description of the methods of the invention will become increasingly clear in light of the further description which follows.

Paragraph 0032

Paragraph 0032 has been amended as follows:

[0032] Figure 6 depicts the photodiode A and photodiode B currents 400, 500, of Figures 4 and 5 on an inverted scale (negative up). One aspect of silicon used by the invention is

demonstrated by Figure 6. Regardless of the thickness, silicon photodiodes cut off at about 1.0 micrometers of wavelength. Figure 6 also illustrates how the optical thickness differential between photodiode A and photodiode B may be used to provide the desired photo-response. The slope of the electronic signal conversion to about 1.0 micrometers is, due to the properties of silicon, approximately proportional to the optical thickness. Subtracting [the difference in] currents between photodiode A and photodiode B from the signal of photodiode B, the much reduced response represented by curve 600 is obtained. Curve 400 represents the current from photodiode A and curve 500 represents the current from photodiode B. As can be seen from curve 600, the manipulation of the separate photodiode signals, in this case $I_{OUT} = n*(I_B - (I_A - I_B)$ results in signal 600 centered at approximately 555 nanometers wavelength.

In the Claims:

Claim 1

Claim 1 has been amended as follows:

1. Apparatus for generating an electronic signal in response to selected wavelengths of light comprising:

a first photodiode for converting at least the selected wavelengths of light to a corresponding first electronic signal;

a second photodiode for converting said [at least additional] wavelengths of light to a corresponding second electronic signal; and

a circuit for manipulating the first and second electronic signals to generate an output signal in response to the selected wavelengths of light.

Claim 9

Claim 9 has been amended as follows:

9. Apparatus for generating an electronic signal in response to selected wavelengths of light comprising:

a first sensor for converting at least the selected wavelengths of light to a corresponding first electronic signal;

a second sensor for converting said [at least additional] wavelengths of light to a corresponding second electronic signal;

wherein the first and second sensors are provided with a spectral sensitivity differential; and

a circuit for manipulating the first and second electronic signals to generate an output signal in response to the selected wavelengths of light.

Claim 16

Claim 16 has been amended as follows:

16. A method of generating an electronic signal corresponding to selected wavelengths of light, the method comprising the steps of:

converting [at least first and second] wavelength ranges of light into first and second electronic signals wherein at least one of the wavelength ranges includes the selected wavelengths; and

manipulating the first and second electronic signals to generate an output signal corresponding to the selected wavelengths of light.

Claim 17

Claim 17 has been amended as follows:

17. The method according to claim 16, wherein the converting step further comprises the steps of:

converting said [a first] wavelength ranges of light, including at least the selected wavelengths of light, to a corresponding first electronic signal; and

converting said [a second] wavelength ranges of light, including at least wavelengths distinct from the selected wavelengths of light, to a corresponding second electronic signal.